

Applicant : Bennett et al.  
Serial No. : 09/975,196  
Filed : October 10, 2001  
Page : 12 of 22

Attorney's Docket No.: 05542-480001 / 5758/CMP

### REMARKS

Claims 1,2, 4-11, and 13-30 are pending in this application. Claims 4-6 and 14-24 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1, 2, 14-16, 17, 21 and 29 are rejected under § 102(e) as being anticipated by U.S. Patent No. 6, 273,803 ("Wang"). Claims 27-29 are rejected under § 102(b) as being anticipated by U.S. Patent No. 5,645,474 ("Kubo"). Claim 29 is rejected under § 102(e) as being anticipated by U.S. Patent No. 6,390,904 ("Gleason"). Claims 4-6, 9, 11, 18, 19 and 25 are rejected under § 103(a) as being unpatentable over Wang. Claim 30 is rejected under § 103(a) as being unpatentable over Gleason in view of U.S. Patent No. 5,740,893 ("Yamamoto"). Claims 7, 8, 10, 13, 20, 22-24 and 26 are rejected under § 103(a) as being unpatentable over Wang in view of Yamamoto.

Claims 1, 4-7, 9, 10, 13-15, 18-25 and 27-30 have been amended and claims 3 and 12 are cancelled. The applicant respectfully traverses the rejections and requests reconsideration in view of the amendments and following remarks.

#### **I. Claims Objected to for Informalities**

The Examiner objected to claims 6, 9, 25 and 26 because of informalities. The claims have been amended to overcome the Examiner's objections, and are now in condition for allowance.

#### **II. The §112 Rejections**

Claims 4-6 and 14-24 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The relevant claims have been amended accordingly to overcome the Examiner's rejections, and are now in condition for allowance.

#### **III. The §102 Rejections**

##### Claims 1 and 2

Claims 1, 2, 14-17, 21 and 29 are rejected under § 102(e) as being anticipated by Wang. Claim 1 recites a carrier head for chemical mechanical polishing including a base, a mounting assembly, a retainer and a damping material. The base has at least a portion formed of a

Applicant : Bennett et al.  
Serial No. : 09/975,196  
Filed : October 10, 2001  
Page : 13 of 22

Attorney's Docket No.: 05542-480001 / 5758/CMP

polymer. The mounting assembly is connected to the base and has a surface for contacting a substrate. The retainer is secured to the portion of the base to prevent the substrate from moving along the surface. The damping material is secured between the retainer and the portion of the base to reduce the translation of vibrational energy between the retainer and the base.

The Examiner asserts that Wang discloses a carrier head including a base having at least a portion formed of a polymer and refers to element 16, a ring member, shown in Wang at FIG. 11. The Examiner fails to reference where in Wang element 16 is disclosed as being formed from a polymer. The applicant submits that Wang fails to disclose what material element 16 is made from, and does not disclose or suggest that a polymer may be used.

The Examiner further asserts (in reference to applicant's claim 12, which is now cancelled, and the limitation included in claim 1) that Wang discloses a damping material secured between a retainer and the portion of the base, referring to portion 4b of element 4 of Wang, shown in FIG. 11. Wang's portion 4b of element 4 is an adhesive (Col. 8, line 19). The adhesive 4b bonds the ring member 16, a sheet 4 and a retaining ring 3. There is no disclosure or suggestion in Wang that the adhesive 4b is a damping material, as required by claim 1. Further, there is nothing inherent about an adhesive that makes it a damping material. In any event, there is nothing disclosed or suggested by Wang that the adhesive 4b reduces the translation of vibrational energy between a retainer and a base of a carrier head, as required by claim 1. Accordingly, claim 1 is not anticipated by Wang and is in condition for allowance. Claim 2 depends from claim 1, and is therefore allowable for at least the same reasons.

#### Claims 14-17

Claim 14 recites a carrier head for chemical mechanical polishing including a base, a mounting assembly, a retainer and a damping material. The mounting assembly is attached to the base and has a surface for contacting a substrate. The retainer is secured to the base to prevent the substrate from moving along the surface. The damping material is secured between the retainer and the base to reduce the translation of vibrational energy between the retainer and the base.

Applicant : Bennett et al.  
Serial No. : 09/975,196  
Filed : October 10, 2001  
Page : 14 of 22

Attorney's Docket No.: 05542-480001 / 5758/CMP

As discussed above in reference to claim 1, Wang fails to disclose or suggest a damping material secured between a retainer and a base to reduce the translation of vibrational energy between the retainer and the base. Wang's element 4b, relied on by the Examiner, is an adhesive and there is no suggestion in Wang that the adhesive is a damping material, nor that the adhesive reduces the translation of vibrational energy between a retainer and a base. Accordingly, claim 14 is not anticipated by Wang and is condition for allowance. Claims 15-17 depend from claim 14 and are therefore allowable for at least the same reasons.

#### Claim 21

Claim 21 recites a carrier head for chemical mechanical polishing including a base, a mounting assembly attached to the base having a surface for contacting a substrate, and a retainer secured to the base to prevent the substrate from moving along the surface. At least a bottom portion of the retainer includes a material selected from the group consisting of polytetrafluoroethylene, perfluoroalkoxy, polyetherketoneketone, polybenzimidazole, an imidized thermoset polyimide, a semi-crystalline thermoplastic polyester, and a long molecular chain molecule produced from poly-paraphenylene terephthalamide.

The Examiner asserts that Wang discloses a bottom portion of a retainer that includes either polyethylene terephthalate or polyether ether ketone. Wang does not disclose a bottom portion of a retainer made from a material included from the group recited in claim 21, as amended. Accordingly, claim 21 is allowable over Wang.

#### Claim 29

Claim 29 recites a retaining ring for a chemical mechanical polishing head including an upper portion and a bottom portion. The upper portion is configured to be secured to a base. The bottom portion includes a material selected from the group consisting of polytetrafluoroethylene, perfluoroalkoxy, polyetherketoneketone, polybenzimidazole, a semi-crystalline thermoplastic polyester, and a long molecular chain molecule produced from poly-paraphenylene terephthalamide.

The Examiner asserts that Wang discloses a bottom portion of a retainer that includes either polyethylene terephthalate or polyether ether ketone. Wang does not disclose a bottom

Applicant : Bennett et al.  
Serial No. : 09/975,196  
Filed : October 10, 2001  
Page : 15 of 22

Attorney's Docket No.: 05542-480001 / 5758/CMP

portion of a retainer made from a material included from the group recited in claim 29, as amended. Accordingly, claim 29 is allowable over Wang.

Claims 27-29

Claims 27-29 are rejected under § 35 U.S.C. 102(b) as being anticipated by Kubo. Claim 27 recites an article for attachment to a carrier head. The article includes a generally flat annular body configured to be detachably secured at an outer perimeter of a carrier head, the annular body formed of a damping material and having a plurality of apertures therethrough, each aperture configured to allow a connector to pass through the article.

The Examiner refers Kubo's elements 4, 5 or 6 as disclosing an attachment to a carrier head including a generally flat annular body configured to be detachably secured at an outer perimeter of a carrier head, the annular body formed of a damping material and having a plurality of apertures therethrough. The Examiner asserts that the materials used to make elements 4, 5 or 6 inherently include a plurality of pores (apertures) therethrough. The applicant respectfully disagrees with the Examiner that a pore, even if present in said attachment of Kubo's, is an aperture therethrough. In any event, Kubo does not disclose an article that includes apertures, where an aperture is configured to allow a connector to pass through the article. Accordingly, claim 27 is not anticipated by Kubo and is in condition for allowance. Claim 28 depends from claim 27 and is allowable for at least the same reason.

Claim 29 recites a retaining ring for a chemical mechanical polishing head including an upper portion and a bottom portion. The upper portion is configured to be secured to a base. The bottom portion includes a material selected from the group consisting of polytetrafluoroethylene, perfluoroalkoxy, polyetherketoneketone, polybenzimidazole, a semi-crystalline thermoplastic polyester, and a long molecular chain molecule produced from poly-paraphenylene terephthalamide.

The Examiner asserts that Kubo discloses a retaining ring including a bottom portion that includes an imidized thermoset polyimide. Kubo does not disclose a bottom portion of a retainer made from a material included from the group recited in claim 29, as amended. Accordingly, claim 29 is allowable over Kubo.

Applicant : Bennett et al.  
Serial No. : 09/975,196  
Filed : October 10, 2001  
Page : 16 of 22

Attorney's Docket No.: 05542-480001 / 5758/CMP

#### Claim 29 - Gleason rejection

Claim 29 is further rejected under 35 U.S.C. § 102(e) as being anticipated by Gleason. Claim 29 recites a retaining ring for a chemical mechanical polishing head including an upper portion and a bottom portion. The upper portion is configured to be secured to a base. The bottom portion includes a material selected from the group consisting of polytetrafluoroethylene, perfluoroalkoxy, polyetherketoneketone, polybenzimidazole, a semi-crystalline thermoplastic polyester, and a long molecular chain molecule produced from poly-paraphenylene terephthalamide.

The Examiner asserts that Gleason discloses a retaining ring including a bottom portion that includes polyether ether ketone. Gleason does not disclose a bottom portion of a retainer made from a material included from the group recited in claim 29, as amended. Accordingly, claim 29 is allowable over Gleason.

#### **IV. The § 103(a) Rejections**

Claims 4-6, 9, 11, 18, 19 and 25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang.

#### Claims 4-6

Claim 4 recites the carrier head of claim 2, where the ring-shaped body includes at least one boss extending to contact the retainer. The Examiner acknowledges that Wang does not disclose a ring-shaped body including at least one boss extending to contact the retainer. However, the Examiner asserts that Wang discloses the use of a boss for reinforcement in a retaining ring used to contact an element next to it, referring to Wang's FIG. 10. The Examiner further asserts that therefore, exactly where a boss is located would have been obvious to one having ordinary skill in the art at the time the invention as made as long as the boss is used to surround a screw for reinforcement.

The applicant respectfully disagrees with the Examiner's assertion. Claim 4 depends from claim 2 which depends from claim 1, and accordingly claim 4 includes the limitations of claims 1 and 2. The carrier head of claim 4 includes a damping material secured between the

Applicant : Bennett et al.  
Serial No. : 09/975,196  
Filed : October 10, 2001  
Page : 17 of 22

Attorney's Docket No.: 05542-480001 / 5758/CMP

retainer and a portion of the base, which portion is a ring-shaped body extending the perimeter of the base. Accordingly, a boss extending from the ring-shaped body to contact the retainer thereby extends through the damping material. Wang fails to disclose or suggest a boss extending from a ring-shaped body through a damping material to contact a retainer. The Examiner asserts that such a boss is obvious in view of a boss shown in Wang's FIG. 10. However, the boss shown in Wang's FIG. 10 does not extend through a damping material. Further, there is no reason in Wang for such a boss to surround a screw as asserted by the Examiner because in Wang the ring member 16 and the retaining ring 3 are not screwed to one another, and element 4b is an adhesive between the ring member 16 and the retaining ring 3. Accordingly, it would not have been obvious to modify Wang as suggested by the Examiner, and claim 4 is not obvious in view of Wang. Claims 5 and 6 depend from claim 4 and are therefore allowable for at least the same reasons.

#### Claim 9

The Examiner asserts that Wang does not disclose using polyvinylchloride thermoplastic for a damping material in Wang's FIG. 11, but that in the embodiment shown in FIG. 12, Wang discloses using polyvinylchloride for the material of a sheet 17 placed above sheet 4. The Examiner further asserts it would have been obvious to one having ordinary skill in the art to place a sheet 17 made from polyvinylchloride thermoplastic above the sheet 4 for reinforcement therefore, which sheet 17 would then function as a damping material.

Claim 9 depends from claim 7, and thereby includes the limitation of claim 7. Claim 7 recites the carrier head of claim 1, where the polymer includes polyphenylenesulfide, carbon fibers and polytetrafluoroethylene. Claim 9 recites that the damping material includes a polyvinylchloride thermoplastic. First, the Examiner does not assert that Wang suggests or discloses a portion of a base made from a polymer including polyphenylenesulfide, carbon fibers and polytetrafluoroethylene, as required by the claim, and accordingly, claim 9 is allowable over Wang.

Second, although Wang may disclose using a sheet made from a polyvinyl chloride, there is no suggestion in Wang that the sheet is used as a damping material. There are any number of

Applicant : Bennett et al.  
Serial No. : 09/975,196  
Filed : October 10, 2001  
Page : 18 of 22

Attorney's Docket No.: 05542-480001 / 5758/CMP

different uses of polyvinylchloride thermoplastic. Claim 9 (including the limitations of base claim 1) specifically recites a damping material secured between a retainer and a portion of the base to reduce the translation of vibrational energy between the retainer and the base where the damping material includes a polyvinylchloride. Wang says nothing about the sheet 17 being a damping material to reduce the translation of vibrational energy between a retainer and a base, and in fact, seems to say nothing whatsoever about the function of the sheet 17. Accordingly, a *prima facie* case of obviousness has not been established and claim 9 is allowable over Wang.

#### Claim 11

Claim 11 recites the carrier head of claim 1, wherein the entire base is formed from the polymer. For at least the reasons discussed above in reference to claim 1, Wang does not disclose the limitations of claim 1 (the base claim), and therefore claim 11 is also allowable over Wang. Further, the Examiner asserts that the ring member 16 disclosed in Wang is included in Wang's base, yet Wang does not disclose a material that the ring member 16 is made from, and therefore does not disclose an entire base formed from a polymer as required by claim 11. Accordingly, claim 11 is allowable over Wang.

#### Claims 18 and 19

Claim 18 recites the carrier head of claim 17, further including at least one screw extending through apertures in the base, the ring-shaped body and the damping material and into a receiving recess in the retainer to secure the retainer to the base. The Examiner does not refer to any specific passages or figures in Wang that disclose the limitations of claim 18.

In any event, the applicant respectfully submits that Wang teaches against including at least one screw extending through apertures in the base, the ring-shaped body and the damping material and into a receiving recess in the retainer to secure the retainer to the base. According to the Examiner, the ring-shaped body recited in claim 18 corresponds to the ring member 16 in Wang's FIG. 11 and the damping material recited in claim 18 corresponds to the adhesive 4b in Wang's FIG. 11. Wang expressly discloses that the ring member 16 is attached by screws to a base, and that the ring member and retainer ring 3 are bonded by the adhesive 4b and an adhesive 4a [Col. 8, lines 14-28]. Wang boasts this as an advantage, stating that "[d]ue to this, it is

Applicant : Bennett et al.  
Serial No. : 09/975,196  
Filed : October 10, 2001  
Page : 19 of 22

Attorney's Docket No.: 05542-480001 / 5758/CMP

possible to detach the ring member 16, sheet 4, and retainer ring 3 in one unit from the carrier base 11 by unscrewing the male screws 15b from the female threaded holes 15a", which screws 15b extend only into the ring member 16 and not into the retainer ring 3. Accordingly, Wang does not disclose the limitations of claim 18 which is in condition for allowance.

#### Claim 19

Claim 19 recites the carrier head of claim 17, wherein the ring-shaped body includes at least one boss surrounding the screw and extending to contact the retainer. As discussed above in reference to claims 4-6, Wang fails to disclose such a boss extending from a ring-shaped body to container the retainer, and therefore extending through the damping material. Further, there is no reason for such a boss or screw in Wang, since Wang promotes using an adhesive 4b to bond a ring member 16 to a retainer ring 3, as discussed above in reference to claim 18. Accordingly, claim 19 is allowable over Wang.

#### Claim 25

Claim 25 recites an article for attachment to a carrier head, including a ring-shaped body configured to be detachably secured at an outer perimeter of a carrier head, the ring-shaped body formed of a polymer and having a plurality of apertures therethrough and a plurality of bosses surrounding the apertures. Wang discloses a ring member 16, but does not disclose what material the ring member is made from, and accordingly does not disclose that the ring member is a polymer. Further, the ring member 16 of Wang does not include a plurality of apertures therethrough. There are recesses formed in the ring member 16 to receive screws 15b, but neither the screws nor the apertures extend through the ring member 16 (*i.e.*, from one side to the other or "therethrough"). Further, Wang discloses that the ring member 16 is bonded to the retainer ring 3 by adhesives 4a and 4b, and accordingly this is no motivation for the apertures and screws to extend through the ring member 16 and into the retainer ring 3. Finally, Wang does not disclose a plurality of bosses surrounding the plurality of apertures. Accordingly, the limitations of claim 25 are not disclosed by Wang, and claim 25 is in condition for allowance.



Applicant : Bennett et al.  
Serial No. : 09/975,196  
Filed : October 10, 2001  
Page : 20 of 22

Attorney's Docket No.: 05542-480001 / 5758/CMP

### Claim 30

Claim 30 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Gleason in view of Yamamoto. Claim 30 recites the retaining ring of claim 29, where the bottom portion of the retaining ring further includes at least one of graphite or carbon fibers. Neither Gleason nor Yamamoto disclose a retaining ring including a bottom portion made from a material included in the group recited in the base claim 29. Accordingly, claim 29 is allowable over Gleason and Yamamoto and claim 30 is allowable for at least the same reasons.

### Claims 7, 8, 10 and 13

Claims 7, 8, 10 and 13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Wang in view of Yamamoto; the claims all depend from claim 1. As discussed above in reference to claim 1, Wang fails to disclose or suggest the limitations of claim 1, including the limitation of a damping material secured between a retainer and a portion of the base to reduce the translation of vibrational energy between the retainer and the base. Yamamoto also fails to disclose or suggest this limitation. Accordingly, the base claim 1 is allowable over Wang and Yamamoto, and therefore the dependant claims 7, 8, 10 and 13 are also allowable for at least the same reasons.

### Claim 20

Claim 20 recites the carrier head of claim 14, wherein a bottom portion of the retainer includes at least one of carbon, fluoropolymer and polyester. The Examiner does not cite any passage or figures of Wang or Yamamoto as disclosing the limitation of claim 20. Accordingly, claim 20 is in condition for allowance. Further, Wang fails to disclose the limitations of the base claim 14, including the limitation of a damping material secured between a retainer and a base to reduce the translation of vibrational energy between the retainer and the base. Yamamoto also fails to disclose or suggest this limitation. Accordingly, the base claim is allowable over Wang in view of Yamamoto, and therefore the dependent claim 20 is allowable for at least the same reason.

Applicant : Bennett et al.  
Serial No. : 09/975,196  
Filed : October 10, 2001  
Page : 21 of 22

Attorney's Docket No.: 05542-480001 / 5758/CMP

#### Claims 22-24

Claims 22-24 depend from claim 21, and are rejected as being unpatentable over Wang in view of Yamamoto. Neither Wang nor Yamamoto disclose a retainer including a bottom portion formed from a material included in the group recited in the base claim 21. Accordingly, the base claim 21 is allowable over Wang in view of Yamamoto, and accordingly the dependent claims 22-24 are allowable for at least the same reason.

#### Claim 26

Claim 26 depends from claim 25 and is rejected as being unpatentable over Wang in view of Yamamoto. As discussed above in reference to claim 25, Wang fails to disclose or suggest the limitations of claim 25, including the limitation of a ring-shaped body formed of a polymer and having a plurality of apertures therethrough and a plurality of bosses surrounding the apertures. Yamamoto also fails to disclose or suggest this limitation. Accordingly, the base claim 25 is allowable over Wang in view of Yamamoto and therefore the dependent claim 26 is allowable for at least the same reason.

Brenda Leeds Binder has been given limited recognition under 37 CFR § 10.9(b) as an employee of the Fish & Richardson PC law firm to prepare and prosecute patent applications wherein the patent applicant is a client of Fish & Richardson PC and the attorney or agent of record in the applications is a registered practitioner who is a member of Fish & Richardson, which is the case in the present application. A copy of the Limited Recognition document, which expires December 1, 2004, is attached hereto.

No fees are believed due, however, please apply any charges or credits to deposit account 06-1050.

Applicant : Bennett et al.  
Serial No. : 09/975,196  
Filed : October 10, 2001  
Page : 22 of 22

Attorney's Docket No.: 05542-480001 / 5758/CMP

Respectfully submitted,

Date: July 21/04

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